

## Physiological and Psychological Barriers for Progress the Stages to Quit Smoking among People with Schizophrenia

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### Background

The high prevalence of smoking in people with mental illness leads to higher rate of smoking-related diseases and early mortality. Among people with mental disorders, the prevalence of smoking has been reported the highest among people with schizophrenia and most of them are not think of quitting. Helping these individuals to progress their stage of change to quit smoking should be prioritized. However, studies are lacking on the barriers that influence the stages of readiness to quit smoking in people with schizophrenia.

### Aim

This study aims at identifying the physiological and psychological contributors to progressing along the stages of readiness change in smoking behavior among people with schizophrenia.

### Methods

Participants who were current smokers with a diagnosis of schizophrenia were recruited from 47 community-based mental health care settings in Hong Kong. Eligible participants were invited to complete a survey questionnaire consisted of questions on demographics, smoking behaviours, readiness to quit, physiological aspects such as nicotine dependence, and psychological aspects including perceived health status, psychological flexibility, acceptance towards internal experiences induced by craving, emotion regulation, social support from family and friends, self-efficacy of smoking and general self-efficacy. Their level of exhaled carbon monoxide was also assessed using micro smokerlyzer.

Comparison between different stages of readiness to change in factors such as socio-demographics, smoking behaviors, physiological and psychological aspects were performed using chi-square or one-way ANOVA followed by the Turkey's post hoc test. The predictive factors contributed to progress the stages of readiness to change were further analyzed by ordinal logistic regression. Tests for proportional odds were conducted to test the homogeneity of the effects across all categories of the dependent variables.

### Results

Two hundred and nineteen participants were approached, 187 completed the questionnaire. Demographic characteristics of participants in different stages of readiness to quit are shown in table 1. Most participants were at pre-contemplation stage. There were significant differences in gender ( $X^2(2, N = 187) = 6.59, p = .04$ ), perceived mental health status ( $F(2, 180) = 3.13, p = .05$ ), self-perceived importance in quitting ( $F(2, 180) = 32.45, p < .001$ ) and being able to quit ( $F(2, 182) = 15.73, p < .001$ ), and perceived social support from family ( $F(2, 178) = 9.55, p < .001$ ) and friends ( $F(2, 179) = 3.46, p = .03$ ) among participants in different stages of readiness to change.

Participants at pre-contemplation stage showed significantly less perceived support from family and friend, lower self-perceived importance of quitting and confidence in being able to quit. However, no significant difference was found between perceived mental health status and different stages of readiness to change at post hoc analyze. Higher self-perceived importance of quitting was important psychological predictor to a later stage of readiness to quit smoking (Table 3). To determine the strength of the association between the predictor model and stages of readiness to quit, Nagelkerke's  $R^2$  was computed, yielding a value of 0.349, suggesting a small relationship of 34.9% between predictor and prediction.

### Discussion

Examining the factors affecting the readiness of people with schizophrenia to quit smoking can provide insight to health professions in tailoring the intervention for them. The result of current study indicated the impact of patients' self-perceived importance of smoking cessation on the progress of the stages of readiness to quit. Strategies designed to increase this psychological factor such as health education and modeling effects may contribute to increase their motivation to quit.

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**Table 1. Characteristics of participants in different stages of quitting smoking (N = 187)**

	Pre-contemplation stage (n = 109)	Contemplation Stage (n = 15)	Preparation Stage (n = 63)	F / $X^2$	p
	M ± SD	M ± SD	M ± SD		
Age	48.1 ± 11.5	43.9 ± 9.0	50.6 ± 10.5	2.48	.09
Gender				6.59	.04
Male, n (%)	102 (93.6)	11 (73.3)	55 (87.3)		
Female, n (%)	7 (6.4)	4 (26.7)	8 (12.7)		
Educational attainment				.54	.97
Primary level, n (%)	34 (31.8)	4 (26.7)	19 (30.6)		
Secondary level, n (%)	67 (62.6)	10 (66.7)	38 (61.3)		
Tertiary level, n (%)	6 (5.6)	1 (6.7)	5 (8.1)		
Marital status				1.37	.85
Single, n (%)	72 (66.1)	9 (60.0)	37 (60.7)		
Married, n (%)	18 (16.5)	4 (26.7)	13 (21.3)		
Divorced/Widowed/Separated, n (%)	19 (17.4)	2 (13.3)	11 (18.0)		
Onset of Schizophrenia, years	18.7 ± 12.0	15.2 ± 8.9	20.9 ± 13.5	1.38	.25
*BPRS	25.1 ± 8.7	28.1 ± 6.3	24.3 ± 4.9	1.55	.22
No. of cigarette consumed per day	13.7 ± 8.5	10.0 ± 7.8	13.3 ± 9.3	1.21	.30
Year of smoking	27.3 ± 12.4	19.4 ± 10.2	28.0 ± 14.1	2.84	.06
Nicotine dependence				2.84	.59
Low, n (%)	35 (34.0)	8 (53.3)	23 (38.3)		
Moderate, n (%)	36 (35.0)	5 (33.3)	20 (33.3)		
High, n (%)	32 (31.1)	2 (13.3)	17 (28.3)		
*CO level	21.0 ± 14.1	14.0 ± 11.9	17.8 ± 15.3	1.9	.15
Perceived health status					
$\hat{S}F$ -12: Physical composite scores	45.3 ± 9.8	44.3 ± 9.3	44.0 ± 10.3	0.33	.72
$\hat{S}F$ -12: Mental composite scores	49.0 ± 9.5	44.3 ± 12.9	45.3 ± 11.8	3.13	.05
Psychological flexibility	27.8 ± 9.0	30.0 ± 9.3	26.9 ± 9.4	0.71	.50
Acceptance toward internal experiences	39.7 ± 11.3	38.8 ± 6.4	40.7 ± 9.2	0.15	.86
Emotion regulation					
Cognitive reappraisal	18.6 ± 8.3	17.5 ± 7.0	17.4 ± 7.9	0.48	.62
Suppression	12.2 ± 5.7	12.9 ± 5.6	13.7 ± 6.7	1.26	.29
Self-efficacy of smoking					
Importance to quit	34.6 ± 30.7	76.0 ± 24.4	69.6 ± 30.5	32.45	<.001
Difficulties in quitting	61.2 ± 35.1	60.0 ± 32.7	60.4 ± 35.9	0.02	.99
Confidence in being able to quit	28.3 ± 29.6	53.3 ± 27.7	53.3 ± 30.7	15.73	<.001
Perceived social support					
Family	6.8 ± 1.9	6.1 ± 1.7	5.5 ± 1.8	9.55	<.001
Friends	6.7 ± 2.0	6.5 ± 1.7	5.9 ± 2.0	3.46	.03
General self-efficacy	24.7 ± 7.2	26.9 ± 8.4	26.7 ± 7.6	1.73	.18

Note. \*BPRS = Brief Psychiatric Rating Scale, higher scores indicate higher levels of psychotic symptoms; \*CO = Exhaled carbon monoxide;  $\hat{S}F$ -12 = 12-item Short Form Healthy Survey was used to measure the perceived health status with a mean of 50 and standard deviation of 10 based on HK general population data, higher scores indicate better perceived health states; Stages of readiness to quit was measured by Prochaska's stages of behavior change; Nicotine dependence was assessed by the Fagerstrom Test for Nicotine Dependence; Psychological flexibility was measured by Acceptance and Action Questionnaire-II (AAQ-II), higher score indicates less psychological flexibility; Acceptance towards internal experiences induced by craving were assessed by Avoidance and Inflexibility Scale (AIS); Emotion regulation was measured by Emotion Regulation Questionnaire (ERQ), higher scores indicates less use of the emotion regulation strategies; Self-efficacy of smoking was measured by self-perceived importance and difficulty in quitting, and confidence in being able to quit; Perceived social support was measured by perceived social support from family and friends, higher score indicates less support from family or friend; General self-efficacy was measured by General Self-efficacy Scale (GSE), higher score indicates a higher general self-efficacy.

**Table 2. Logistic regression analyses predicting factors progressing the stages of readiness to quit smoking**

Predictors	Odds Ratio	95% CI	p
Gender (Ref: Female)			
Male	1.51	.53 - 4.33	.44
SF-12: Mental Composite Scores	.98	.95 - 1.01	.22
Self efficacy of smoking			
Importance to quit	1.03	1.02 - 1.04	<.001
Confidence in being able to quit	1.01	1.00 - 1.02	.15
Perceived social support			
Family	.80	.62 - 1.04	.10
Friends	.97	.76 - 1.27	.78

Note. CI = confidence interval; SF-12 = 12-item Short Form Health Survey

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